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EXAMINER

GRAHAM, ANDREW R

ART UNIT	PAPER NUMBER
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2697

DATE MAILED: 08/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/427,815

Applicant(s)

ROSSUM, DAVID P.

Examiner

Andrew Graham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Drawings

1. New drawings were received on June 2, 2003. These drawings are approved by the examiner.

Specification

2. The new specification has also been approved and inserted into the case.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. **Claims 15 and 26** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 15 includes the limitation, "said halfband filtering follows said interpolating". Claim 15 depends from Claim 12, which includes the limitations, "halfband filtering said plurality of data points with a half band filter to provide intermediate data points" and "interpolating the intermediate data points with an interpolator". Based on the production and then processing of these intermediate data points, Claim 12 ascertains a set order to the processes, wherein the

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interpolating must follow the filtering. This aspect of Claim 12 conflicts with the limitation of Claim 15 listed above.

Claim 26 is rejected on the same basis as Claim 15 for including the same limitation.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1-6, 10, and 17-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor (USPN 5982305) in view of applicant's admitted prior art.

Regarding **Claim 1**, Taylor discloses a digital sample rate converter for use with a computer system. The system of Taylor is taught as being able to change the variable input signal sample rate to a specified output signal sample rate (col. 3, lines 2-6 and col. 9, lines 24-40). This reads on "a method for converting an input signal to one of a plurality of differing output sample rates". The process involved with changing the

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rates first involves receiving a discrete time input signal $x(n)$ and applying it to an interpolator (106) (col. 7, lines 17-36). This part of the process reads on "receiving, at an input sample rate, a plurality of data points, associated with the input signal". The process then involves the use of a predetermined filter (110) that is designed for signals that fall within a specific predetermined range (col. 7, lines 37-49). The standard parts of a digital signal include a passband, which includes the frequencies with the image information, as well as a guardband or transition band. As the system initially receives the entire input signal and the filter is arranged to know a predetermined range for the passband of the image, this inherently means that the system has knowledge of the details of the initial transition band of the input signal as well. In the case of Taylor, the input rate is particularly obtained at the beginning of the signal processing procedure (col. 8, lines 44-47). These inherent signal properties, along with the determining of the frequency of the input signal read on "operating on said plurality of data points to associate said signal with a predetermined set of parameters" and "said set of parameters including a first transition band". The filter (110) includes a transition band, the effects of which are applied to obtain a filtered signal $w(k)$ which is then applied to a decimation function (114) to finally convert the initial signal to the desired sample rate (col. 7, lines 50-67 and col. 8, lines 1-9). Taylor, again, specifically states that the system is able to

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work on a continuous range of output sample rate (col. 3, lines 30-34). The factors involved in changing this rate are particularly taught as being selectable, according to a chosen filter value, and a table of possible input and output sample rates are included in the disclosure (col. 4, lines 9-22 and col. 8, lines 51-60 and col. 9, lines 24-40). This processing, the filtering followed by the final stage of signal decimation reads on "dynamically varying said input sample rate associated with said input signal to any one of the plurality of differing output sample rates by an interpolator having associated therewith a second transition band". Again, the output is reproduced at the different sampling rate, but without adversely affecting the original signal quality, which reads on "a second signal is produced having a sequence of data samples approximating the input signal" (col. 3, lines 2-6).

In regards though to the specifics of the circuitry of his system, Taylor does not specify:

- that the width of this second transition band is a function of the spectral separation of the transition band and image of the input signal

In the specification of the application, the applicant discloses several examples of previous forms of sample rate converters that are well known in the art. Specifically, the applicant discloses the various components of previously well known sample rate converters, including a variety of circuits

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referred to as "interpolation filters" which perform interpolation and filtering within as part of the component (page 4, lines 14-16, 20, 31 and Figs. 1B, 2B, 2E, 3C, 3F). The two different versions of these mentioned in the specification as "classical" single stage interpolators are a "less conservative" one, which has a transition band equal to twice the guardband of the input signal and a "more conservative" one, which has a transition band equal to the guardband of the input signal (page 3, lines 21-25). This knowledge of the bands of the input signal also reads on "said set of parameters including a first transition band". The two types of combined interpolator filters listed in the applicant's admitted prior art read on "an interpolator having associated a second transition band, with the width associated with said second transition band being a function of a spectral separation of said first transition band and said image".

To one of ordinary skill in the art at the time of the invention, it would have been obvious to include the interpolation filters of the applicant's admitted prior art in the digital sample rate conversion means of Taylor. Taylor discusses the use of a plurality of predefined filters with controllable characteristics including the various widths of their associated bands; the applicant's admitted prior art specifically lists particular modifications of these bands that have been previously used to achieve the desired signal modification. The applicant's admitted prior art also includes a

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number of different types of interpolation filtering, which would have also enhanced the signal conditioning capabilities of the system of Taylor. In terms of components, the signal processing devices in the applicant's admitted prior art are considered "interpolation filters" that implement both the interpolation and filtering effects. This aspect of the applicant's admitted prior art would have also benefited the system of Taylor because the concurrent filtering and interpolating would have eliminated the need for buffers or other memories for holding the sample values between processing stages, as well as shortened the processing time for the signal values.

Regarding **Claim 2**, Taylor discloses that the filter (110) is preferably a finite impulse response (FIR) filters, and notes that the coefficients of this filter can be varied (col. 7, lines 37-66). In dealing with digital signals, the standard operating procedure of an FIR involves convoluting a finite set of coefficients with a finite and equal number of values from the input signal. The inherency of this operation reads on "producing each data sample associated with said second signal by convolving a predetermined finite number N of data points with an equal number of coefficients".

Regarding **Claim 3**, the standard operation of a digital FIR filter, such as that disclosed by Taylor, inherently involves convolving the input data with the coefficients of the filter (col. 7, lines 50-66). The very definition of a finite impulse response includes the feature that the coefficients of the

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realizing filter vary according to the input time currently being processed. The digital input data is handled sequentially, and the contribution of each data sample value towards the single output value is controlled by the coefficients of the filter and varies from output sample to output sample. This reads on "coefficients vary as a function of the temporal spacing between the output point and the corresponding input points".

Regarding **Claim 4**, the interpolation function (106) of Taylor increases the sample rate of the input signal (col. 7, lines 26-36). Table 1 in column 9 lists some common conversion rates, which also shows that the overall sample rate may be increased by the system of Taylor. This reads on "varying said input sample rate increases said input sample rate".

Regarding **Claim 5**, the decimation function (114) of Taylor decreases the sample rate of the input signal (col. 8, lines 1-9). Table 1 in column 9 lists some common conversion rates, which also shows that the overall sample rate may be decreased by the system of Taylor. This reads on "varying said input sample rate decreases said input sample rate".

Regarding **Claim 6**, the Table in column 9 of Taylor shows that certain input sample rates, such as 22050 Hz and 11025 Hz, may specifically be doubled by the system of Taylor. This reads on "operating on said plurality of data points includes up-sampling said plurality of data points by a factor of two".

Regarding **Claim 10**, the filter (110) of Taylor is noted as preferably being an FIR filter, which reads on "operating on said

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plurality of data points to associate said input signal includes filtering the same with a finite impulse response filter" (col. 7, lines 37-66).

Regarding **Claim 17**, the digital sample rate converter of Taylor is particularly described in the context of a computer-executable set of instructions for use in various computing environments (col. 5, lines 51-67). This reads on, "A computer program product". With this computing environment, Taylor specifically discloses the possible use of a number of different memories, which reads on "a computer readable storage medium for storing code" (col. 6, lines 1-37). Regarding the remaining limitations of the claim, please refer to the like teachings of Claim 1.

Regarding **Claim 18**, please refer to the like teachings of Claim 6.

5. **Claims 7-9, 11-16, and 19-33** are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor in view of the applicant's admitted prior art as applied above, and in further view of Orban (USPN 6337999).

As detailed above, Taylor discloses a digital sample rate converter that can handle a continuous range of input and output sample rates. The teachings of Taylor include upsampling, filtering, and then downsampling in order to achieve the final desired sampling rate for an input signal. The applicant's admitted prior art discloses a variety of well-known filters and

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filter shape values, as well as the concept of concurrently interpolating and filtering with the same component.

While Taylor and the applicant's admitted prior art disclose the use of filters, they do not specify:

- that the filtering involved includes a half band filter

Orban discloses the functioning and components for a digital oversampled differential clipper. The system of Orban also includes upsampling, downsampling, filtering, and summation to decrease aliasing in such signal conditioning. Orban also teaches a method for operating on the aliasing components and including them in the signal shaping process (col. 5, lines 7-20). Figure 2 illustrates one given embodiment of the system of Orban, which includes cascaded pairs of interpolators and filters that are noted to make the illustrated system particularly economical efficient (col. 5, lines 21-32). Between stages of upsampling downsampling, the filters (230-233) in these cascaded pairs are specifically polyphase halfband FIR filters (col. 4, lines 22-24). This reads on "operating on said plurality of data points includes filtering said plurality of data points with a half-band filter".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to include the cascaded system arrangement of Orban in the system of Taylor in view of the applicant's admitted prior art. The motivation

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behind such a modification would have been that the cascading approach would have further enhanced the variable rate capabilities of the system of Taylor in view of the applicant's admitted prior art. Taylor and Orban both disclose the basic sample rate conversion approaches of upsampling, filtering, and decimating, and both references disclose the conversion of the input signal to a plurality of different sampling rates. The combined system would have offered the best combination of efficiency, as taught by the cascading of the filter/interpolator pairs, but also the adjustability, as taught by the programmable features of Taylor. The teachings of Orban would have also been desirable in combination with those of Taylor and the applicant's admitted prior art because Orban discloses a manner for not only removing unwanted aliasing noises, but using them in the processing them as well.

Regarding **Claim 8**, interpolator-filter combinations were discussed previously in regards to Claim 1. Decimation being the inverse of interpolation, decimation filters would be of the same processing nature as interpolation filters. Orban discloses filter-decimator pairs (230/250, 231/251, 232/252, 233/253) that half-band filter an input signal and then decrease the sampling rate by a factor of two (col. 4, lines 18-24). Taylor also discloses a sequential filter (110) and decimator (114). Collectively and following the same arguments and teachings of well known prior art as discussed previously, these half-band filter/downsampler pairs and their signal processing features

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read on "operating on said plurality of data points includes decimating said plurality of data points with a half-band decimator".

Regarding **Claim 9**, Figure 2 of Orban shows one embodiment of his system that decimates the signal received from upsamplers (200,201,202,203) with half-band filter/decimator pairs (230/250,231/251,232/252,233/253) (col. 4, lines 18-24). As discussed in regards to Claims 6 and 8, this reads on "decimating a plurality of data points output by said interpolator with a half band decimator, with varying said sample rate occurring after receiving said plurality of data points and before decimating said plurality of data points".

Regarding **Claim 11**, the final processing stages of the embodiment shown in Figure 2 of Orban include a filter (420) that is a fifth order infinite impulse response (IIR) filter (col. 4, lines 37-45). The applicant's admitted prior art also notes that IIR filters are known to be used in sample rate conversion systems (page 8, lines 14-23). This reads on "operating on said plurality of data points to associate said signal includes filtering the same with an infinite impulse response filter".

Regarding **Claim 12**, please refer to the like teachings of Claims 1, 6, and 7, noting that Taylor specifically notes that an intermediate digital signal $w(k)$ is obtained after filtering and then supplied to the decimation function (114) (col. 7, lines 66-67 and col. 8, lines 1-9).

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Regarding **Claim 13**, Figure 2 of Taylor illustrates that the rate increasing function (106) is followed by the filtering (110) and then the decimation function (114). As noted in regards to Claim 1, the applicant's admitted prior art particularly discloses the concept of an "interpolation filter", wherein the functions of interpolating and filtering are performed by the same component. As noted in regards to Claim 7, Orban teaches the concept of half-band filtering. Collectively, these teachings read on "said halfband filtering is done in conjunction with upsampling said plurality of data points". The orders of the signal processing in Taylor and Orban read on "said interpolation follows said upsampling and halfband filtering".

Regarding **Claim 14**, Taylor discloses that the filtering and decimation stages are performed separately and sequentially (Figure 2 and col. 8, lines 1-9). Orban also discloses a system that involves separate processing circuits for upsampling, filtering, and downsampling. In the upsampling sequence shown in the embodiment in Figure 2 of Orban, the FIR filter (400) performs the operation of half-band filtering the input signal without performing any other function, and the output of this component (400) is then passed along to upsampler (201), which interpolates the input signal (col. 1, lines 60-67 and col. 4, lines 1-7). Each of these specific parts of the sequences of Taylor and Orban read on "said halfband filtering is done, without upsampling, on said plurality of datapoints; and said interpolating follows said halfband filtering".

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Regarding **Claim 15**, Figure 2 of Taylor again shows that the filtering (114) is performed after the interpolation function (106). The embodiment of the system of Orban shown in Figure 2 includes an interpolator (201), where the output of this interpolator input into a halfband filter (401). These parts of the processing sequences read on "said halfband filtering follows said interpolating".

Regarding **Claim 16**, Figure 2 of Taylor again shows that an interpolation function (106) and filtering (110) processes are followed by a decimation function (114), and it is noted that decimating is a form of interpolation. The embodiment of the system of Orban shown in Figure 2 includes an upsampler (200) in series with a half-band FIR filter (400) and another upsampler (201). Included further down the signal path are another half-band filter (230) and a decimator (250). With, again, the understanding that an upsampler is a specific form of interpolator, these sequences of components in Taylor and Orban read on "said half-band filtering is done in conjunction with upsampling" and said interpolating follows said halfband filtering" and "halfband filtering and decimation following said interpolation".

Regarding **Claim 19**, please refer to the like teachings of Claim 7. Regarding **Claim 20**, please refer to the like teachings of Claim 8. Regarding **Claim 21**, please refer to the like teachings of Claim 8. Regarding **Claim 22**, please refer to the like teachings of Claims 10 and 11. Regarding **Claim 23**, please

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refer to the like teachings of Claims 6, 12, and 17. Regarding **Claim 24**, please refer to the like teachings of Claim 13.

Regarding **Claim 25**, please refer to the like teachings of Claim 14. Regarding **Claim 26**, please refer to the like teachings of Claim 15. Regarding **Claim 27**, please refer to the like teachings of Claim 16.

Regarding **Claim 28**, the applicant discloses as part of the background of the specification that Nth order FIR sample rate converters are known in that art fall under the category of 'intermediate quality' converters (page 8, lines 4-10). The applicant also gives a formula for determining the complexity of the involved computation of such a converter (Page 8, lines 7-10). This inherently reads on "interpolator is an FIR Nth order sum of products interpolator with linear interpolation of coefficients".

Regarding **Claim 29**, please refer to the like teachings of Claim 28.

Regarding **Claim 30**, the details of the widths of the transition bands of classical type of interpolation filters were discussed in reference to Claim 1. One of these admitted, well known interpolation filters involved a transition band that was twice the width of the guardband of the input signal (page 4, lines 14-15). Looking at Figure 2B, it can be seen that this width spans from the highest edge of the lowest frequency image to the lowest edge of the passband of the next image. This reads on "interpolator has a transition band beginning adjacent the top

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of a passband and ending adjacent the bottom of a passband image".

Regarding **Claim 31**, please refer to the like teachings of Claim 30.

Regarding **Claim 32**, one of the specific filtering components that Orban teaches is a fifth-order IIR filter with a sixth-order allpass group detector (col. 4, lines 39-42). With this arrangement in place, it would have been inherent that different orders of allpass detectors would have been usable in the system. Different orders perform the same general processing function, except with different numbers and arrangement of components, and with slightly variant output responses. The specifics of each of the different orders of allpass components would have been well known in the art, thus making evident the advantages and disadvantages of different orders in use with different systems. This reads on "said halfband filter is an IIR filter composed of first order allpass blocks".

Regarding **Claim 33**, please refer to the like teachings of Claim 32.

Response to Amendment

On page 8, lines 19-21, the applicant has stated, "The amendments introduced are by way of clarification and no new limitations have been introduced into the claims and, accordingly, no further search is required". The examiner respectfully disagrees. While the amendments have clarified the

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claims in view of the original specification, the amendments change the scope of what was originally included in the previously examined claims. Thus, these changes do require a new search. A clear example of this can be seen in the amended language of Claim 1. The previous claim limited the method to just "varying said sample rate" of the input signal, whereas the new claim limitations include "*dynamically varying*" the sample rate "*to any one of the plurality of differing output samples rates*". This limitation includes a different, more specific form of varying that was not included or suggested in the original claim language. Claim 12 includes the new feature of "intermediate data points" which after being formed by the halfband filter, are interpolated. These explicit data points impart an order to the previous method, which simply "comprised" filtering and interpolating. The new rejections in this office action reflect this change in limitations. Arguments made against the previous rejections or references in view of this new limitation are considered moot, and are therefore not addressed in this office action.

On page 10, lines 16-17, the applicant has stated, "Clearly Orban does not describe obtaining differing output sample rates based on an interpolation process". While the "differing output sample rates" limitation is new to the claim language and as detailed above is not considered in this response to Orban, it is noted that, depending on the applicant's interpretation of "an interpolation process", Orban does include several stages of

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interpolation and filtering, each of which change the original sample rate to a plurality of varied sample rates (see Figure 2 of Orban).

On page 10, lines 17-19, the applicant has stated, "Orban's "interpolator," being an upsampler which is merely inserting zeros into the signal, does not have any associated transition band". The Examiner respectfully disagrees regarding the applicant's interpretation of the interpolator in the system of Orban. In column 3, lines 7-12, Orban states that the upsampler of the basic form of the invention can be a prior art upsampler well known in the art. The applicant's admitted prior art lists a number of prior art upsamplers, including those with transition bands. As listed in the previous office action, it is the combination of these two teachings that are used in the rejection of Claim 1, not Orban alone.

On page 10, lines 21-23, the applicant has stated, "It is thus submitted that neither Orban nor the prior art description of the present application teach or even suggest an interpolator having associated therewith a second transition band". The examiner respectfully disagrees. As detailed in the office action, the applicant's admitted prior art specifically discusses interpolators with transition bands. The criteria for the widths of the transition bands is also discussed in the applicant's admitted prior art, which is also noted in the previous office action (final paragraph of page 5, which continues onto page 6).

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On page 11, lines 9-10, the applicant has stated, "Orban's interpolators, whether considered alone or in combination with their associated filters, never allow "dynamically varying" the sampling rate". While again, the limitation of "dynamically" varying a sample rate is a new limitation and cannot be argued in regards to previous rejections and references, it is noted that the basic form of the invention, detailed in column 1, lines 6-56, simply includes upsampling, without a restriction to rate. Orban, as mentioned previously, also notes that the upsampler in the basic form of the system may be an upsampler well known in the art (col. 3, lines 7-11). It is correct that one embodiment shown by Orban includes a 2X filter, but the issue of "dynamically" changing the rate of this filter or not illustrating other interpolation rates is not addressed. Because these possibilities are not addressed, it cannot simply be interpreted to mean that the reference of Orban teaches away from them or does not "allow" such limitations to be included with the disclosed interpolation system. This response applies to the argument presented on page 11, lines 22-23 as well as other related arguments concerning a "dynamic" ability and Orban's interpolator.

On page 11, line 28 through page 12, line 2, the applicant has stated, "Clearly, Orban advocates cascading separate stages for the purpose of efficiency and thus teaches away from combining them in any manner". The examiner respectfully disagrees. The cascading of the filters is the feature that

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makes the embodiment efficient; Under the understanding that an "interpolation filter" of the prior art is a single component, there exists a motivation for combining the interpolator and the filter in each stage, which is outlined in the language of the previous office action, "substituting a combined interpolation filter for the separate interpolator and filter". Substituting an "interpolator filter" for all of the interpolators and filters of Orban, particularly those in Figure 2 would have adversely changed the invention of Orban, but this is not what is proposed in the previous office action.

On page 12, lines 10-14, the applicant has stated, "In the present invention, the sample rate can be varied with a single interpolator, and converting the input signal to differing sample rates may be accomplished by a single interpolator". The examiner notes, however, as discussed previously, this ability to convert a sample rate to a plurality of sample rates based, was not represented in the original claim language. This renders moot such an argument against previous rejections. This response regarding new limitations also applies to the argument presented on page 13, lines 19-21.

On page 14, lines 3-4, the applicant has stated, "Orban does not teach or even suggest independently programmable parameters to provide a varying sample rate". While the examiner agrees with this statement, the applicant's admitted prior art does specify that prior known art filters include adjustable parameters. Lines 30-32 of page 7 of the applicant's disclosure

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states that "When a windowing function is used, the width of the transition band and the filter quality can be independently controlled, but in general there is no independent control of stopband rejection and passband ripple". By stating that "in general" independent controls are not available, the statement is effectively made that prior art includes exceptions that do have independent controls. It is also noted that "independently programmable parameters" is a substantially broad term. The system of Orban involves a number of interpolators that can be prior art upsamplers, though preferably inserts zeros as every other value for a signal; the fact that zeros are used for each filter, and in the detailed embodiment, pad every other value of the input signal with a zero is considered to read on "independently programmable parameters". The lines cited above more specifically illustrate an example where the transition band and filter quality can be controlled, which also reads on "independently programmable parameters". This response applies to the argument presented on page 14, lines 10-21.

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Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Graham whose telephone number is (703) 308-6729. The examiner can normally be reached on Monday-Friday (7:30-4:30), excluding alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Isen, can be reached at (703) 305-4386. The fax number for the organization

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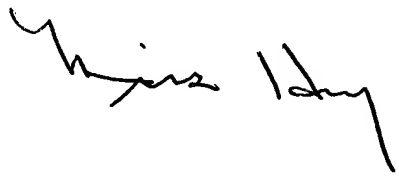
where this application or proceeding is assigned is 703-872-9314 for regular communications, and 703-872-9315 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Andrew Graham
Examiner
A.U. 2697

AG

ag
August 22, 2003


MINSUN OH HARVEY
PRIMARY EXAMINER